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Vol. II September, 1932. No. 8

C O N T E N T S

"Textile Research: A Survey of Progress"

Abstracts

Bibliography

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An Official Publication of
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Vol. II September, 1932 No.8

"TEXTILE RESEARCH: A SURVEY OF PROGRESS"

To Be Published Early In October At The
Low Price to Members of $2.00

"Textile Research: A Review of Progress," the first book to be published by U. S. Institute, is now on the press and should be ready for delivery early in October. It is U. S. Institute's outstanding accomplishment of the current fiscal year, and the Board of Editors and all others who have cooperated to make possible the publication of the book have every reason to feel proud of their work. It is now up to U. S. Institute members to see that it is given the wide distribution that it deserves.

As originally conceived this book was to have been a review of textile research for the year 1931, to be succeeded by similar annual volumes. Such a book would have performed a needed service for those engaged in textile research, and for all textile men of technical training interested in research. The completed book will provide this service, but, in most instances, in text equally intelligible to scientists and to readers lacking scientific training. And instead of being confined to the year 1931 most of the contributors have surveyed the research work of a decade or more, and give the reader an up-to-date picture of the status of research at the close of last year.

The late Dr. Samuel W. Stratton, our first president, hoped that the book might help to awaken the whole textile industry to the need and possibilities of scientific research. His successor, Hon. Francis P. Garvan, not only seconded this idea, but urged the Board of Editors, with the aid of the contributors, to produce a book that would not only tell in as simple language as possible what textile research is and what are its objectives, but that also would record

something of its accomplishments and of its future possibilities; in other words, a book that will help to sell scientific research to the textile industry. The Board of Editors feel confident that the book closely approximates these objectives.

"Textile Research: A Survey of Progress" is a cloth covered, octavo volume of 224 pages, including 33 illustrations. It is dedicated to our first president, Dr. Samuel W. Stratton, and bears the imprint of Technology Press. Valued endorsements of its character and of its value to the industry are contained in the guarantee of its publication cost by the trustees of Massachusetts Institute of Technology, and of its merchandising expense by The Chemical Foundation, Inc.

Subjects and Authors

The introduction, entitled "The Key to Accomplishment," is by Dr. Vannever Bush, vice-president of Massachusetts Institute of Technology. The other contributors and the subjects of their chapters are as follows:

I.- Physical Testing, Prof. H.J. Ball.

II.- Chemical Analysis, J. F. X. Harold.

III.- Dye Chemistry, Prof. L. A. Olney.

IV.- Application of Optical Equipment to Textile Research, Prof.E.R.Schwarz.

V.- Textile Microbiology, Dr. B. E. Proctor and Dr. W. G. Chace.

VI.- Technology of Cotton Manufacture, Prof. H. H. Willis.

VII.- Cotton Fiber Research, Ruby K. Worner.

VIII.- Drycleaning, Prof. P. B. Mack.

IX.- Technology of Woolen and Worsted Manufacture, E. D. Fowle.

X.- Wool Fiber Research, Dr. J. I. Hardy.

XI.- The Laundry Industry, G. H. Johnson.

XII.- Technology of Silk Manufacture, Dr. W. F. Edwards.

XIII.- Silk Fiber Research, Dr. W. M. Scott.

XIV.- Textile Machinery Design, Prof. G. B. Haven.

XV.- Technology of Rayon Manufacture, A. K. Johnson.

XVI.- Rayon Fiber Research, Dr. H. DeW. Smith.

XVII.- Technology of Finishing, W. H. Cady.

XVIII.- Technology of Bast Fiber Manufacture, S. J. Hayes.

XIX.- Bast and Hard Fiber Research, Dr. L. H. Dewey.

XX.- Asbestos Textile Industry, J. M. Weaver.

XXI.- Economic Research, H. V. R. Scheel.

XXII.- Consumer Specifications for Textile Products, L. R. Gilbert.

Appendix.- Index of Abstracts and Bibliography, Official Bulletin of U. S. Institute for Textile Research, Inc., 1931, C. H. Clark.

Special Price to Members: $2.00

The Chemical Foundation's guarantee of the cost of distribution has made it possible to publish a larger first edition than would otherwise have been possible, thus reducing the cost per copy and allowing the sale of bocks to members of U. S. Institute at $2.00 per copy, and for five or more copies at $1.60 per copy. (Members desiring to receive a copy of the book on approval may have that privilege.) To other than members of U. S. Institute the price will be $2.50 per copy, but if five or more copies are purchased the price will be $2.00 per copy.

See That Key Men Get It!

To be of maximum service to the industry, and to satisfy the hopes of those who have gratuitously cooperated to make the publication of this book possible, a personal copy for reading and reference should be made available to all who might be benefited thereby. With that objective in view bulk prices have been made as close to a cost basis as possible in the hope that mill executives will take advantage of them to place a copy in the hands of each of their key men.

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of
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ABSTRACTS

RAYON YARN: SHRINKING POWER.- E. Hensel.
Textilber., 1932, 13, 255-256, 319-322.

The relation between extension and shrinkage in rayon yarns is discussed and a device is described for use in measuring shrinkage, comprising a 60 cm. brass ruler mounted on a stand carrying at each end a porcelain roller over which the yarn passes and at one end a clamp for the yarn the free end of which hangs over the second roller. The results of shrinkage measurements on a 120-denier rayon from the washed bobbins to the hank are given in graphical form and discussed; shrinkage is always higher at the beginning and end of the bobbin than elsewhere. Shrinkage measurements can be used to detect faults ("shiners") due to excessive tension in pirning. Experiments on the shrinkage of acetate, cuprammonium and viscose rayons show the low shrinking power of acetate rayon. (Copied complete from J. T. I., abstract section, Aug.,1932)(C)

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WHAT CAN BE ACHIEVED IN COTTON CARDING AND WHAT CANNOT.- Dr. Arthur E. Oxley.
Fibre & Fabric, Aug. 27, 1932, P. 6-8.

After describing the mechanism of the card and the theory of its operation upon the film of cotton, the author concludes that the things the card achieves are efficient drafting and efficient cleaning of cotton. "In these capacities," he states, "if careful attention is paid to all settings, grinding, stripping, etc., and if the machine is allowed to run at the lowest practicable speed, its efficiency may be made exceptionally high." Some of the things the card does not achieve are listed as follows: Increase of regularity of hank when transforming the lap into sliver; parallelization of fibres within the sliver; selectivity. In conclusion he states: "Were the laps more efficiently cleaned in the picking room or, prior to that, the raw cotton more scientifically ginned, it would not be necessary to make the heavy extravagant strips so commonly seen and there is no doubt that the card could then be made well-nigh perfectly efficient and its life considerably extended. But this is not all. All subsequent machines in the card and spinning room would have a higher drafting efficiency; their cost of upkeep would be lowered and a better yarn would certainly be ensured." (C)

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THE DETECTION AND DETERMINATION OF SMALL QUANTITIES OF METALS IN TEXTILE MATERIALS.- S. R. Trotman.
Am. Dye. Rptr., July 4, 1932, P. 415.

An editorial abstract states "Although metals are easy to identify when present in considerable quantities, their identification is often very difficult when they occur in traces, or are confined to small areas of the material under investigation. In these cases the ordinary methods of analysis are unsuitable and recourse must be had to microchemical methods or delicate colorimetric tests for both qualitative and quantitative purposes." (S)

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THE APPLICATION OF THE STICK ANTIMONY ELECTRODE TO THE MEASUREMENT OF THE pH OF DYE BATHS.- L. R. Parks and H. C. Beard.
Am. Dye. Rptr., July 4, 1932, P. 432.

An editorial abstract states "In the measurement of the pH of dye baths with the stick antimony electrode it is essential that the dye bath must have normal air equilibrium at 25° C. if the electrodes have been calibrated in solutions having this equilibrium condition. This air equilibrium may be obtained for a freshly boiled solution by bubbling CO_2-free air through the dye solution while it is being cooled to 25° C." (S)

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A HEAT TEST APPLIED TO TENDERED COTTON AND LINEN FABRICS.- M. Fort.
J. Soc. Dyers & Col., April, 1932, P. 94.

This is a rapid qualitative method and capable of refinement and improvement on academic lines, but stated here in its simplest form for the possible benefit of those to whom a new qualitative method may be valuable. The fabric to be tested is subjected to dry heat in an air oven and the different rates at which the browning occurs are utilized as a means of distinction, subject to certain safeguards. Several tables are given showing typical data. (S)

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IMPROVING VEGETABLE FIBROUS MATERIAL.- L. Lilienfeld.
E. P., 320, 062.

Viscose is applied to a cotton material which is then treated with an agent to cause shrinkage. Regeneration of the cellulose may be effected before, during, or after the shrinking. By incorporating in the viscose a substance from which a gas can be evolved, hollow spaces or bubbles are produced in the regenerated cellulose. (Copied complete from J. Soc. Dyers & Col., abstract section, Feb., 1932.) (S)

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ANALYTICAL METHODS FOR A TEXTILE LABORATORY.- Walter M. Scott.
Am. Dye. Rptr., July 18, 1932, P. 443.

An editorial abstract states "The Research Committee of the American Association of Textile Chemists and Colorists has recently appointed a special subcommittee to standardize the analytical methods which are applied to the common chemicals and allied materials used by the textile industry. This action is indicative of the active interest in this particular subject among textile chemists at the present time. Therefore it seems to be an opportune moment to present a collection of such analytical methods which might serve as basis for discussion in connection with the work of the above-mentioned sub-committee. Dr. Scott has had an unusual opportunity to test the value of the methods which he proposes, during his ten years of service as Chief Chemist for Cheney Brothers, silk manufacturers. As an active member of the Research Committee of the A. A. T. C. C., he has kept in close touch with all recent developments along this line." This article is one of a series on this same subject and further articles will be abstracted as they appear. (S)

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A REPORT ON THE SPECTRAL REFLECTION OF ELEVEN SAMPLES OF DYED CLOTH.- Walter M. Scott.
Am. Dye. Rptr., Feb. 29, 1932, P. 163.

An introductory note by the author states "On December 6, 1929, the Research Committee of the American Association of Textile Chemists and Colorists authorized the Sub-Committee on Fastness to Washing of Dyed Silk to prepare dyeings of the four standards which had been tentatively adopted as representing the minimum limits for four classes of fastness to washing. Accordingly, a suitable quantity of silk fabric was woven and dyed with each of the four dyestuffs which had been selected for the purpose. Sets of these silk washing standards are now available and may be purchased from the secretary of the A. A. T. C. C.

"In order to have a permanent record of the original color of the standards and of the alteration in color of these standards when subjected to the standard washing tests, it was decided to obtain spectral reflection data on the color of representative samples before and after washing. The eleven samples mentioned above include the four standard dyeings prepared by the silk committee together with one wash test made on Standard No. 1, and two wash tests made on each of the other three standards. A detailed description of these samples is given later in the report.

"The committee is indebted to the Colorimetry Section of the U. S. Bureau of Standards for making the necessary measurements, compiling the data and evaluating the results. The following report of B. S. Test No. Tp64397 was received from the Bureau of Standards in May, 1931, and is now printed by permission of the Director of the Bureau." (S)

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HOLLOW RAYONS. A NOTE ON SOME RECENT DEVELOPMENTS.- A. J. Hall.
Am. Dye. Rptr., July 18, 1932, P. 447.

An editorial abstract states "The so-called hollow rayons represent a type of artificial fibre which, while not in great demand today, is likely to be much more widely used in the future. For it must be admitted that very little progress has been made in the manufacture of rayons capable of being manufactured into fabrics having the warmth of wool and real silk. This property of rayon must ultimately be strongly developed if the manufacture of rayon is to expand so as to replace the cultivation of natural fibres, and it is likely that warmth of handle will be obtained by modifying methods of production, such that the resulting rayon has a more porous structure than it has at present. Air, it may be noted, is one of the worst conductors of heat." (S)

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THE OBSERVATION OF RAYONS IN POLARIZED LIGHT.- John H. Skinkle.
Am. Dye. Rptr., June 6, 1932, P. 355.

In the identification of the rayons, the microscopic method has long been necessary in the cases of viscose and cupra rayons. Acetate and nitro rayons are easily distinguished by the microscope and also by chemical tests, but the identification of a rayon as viscose or cupra has depended principally upon the observations of fibre diameter and cross-section shape. With the advent of stretch-spun viscose, the determination has become more difficult, because of the fact that the diameters are about the same for both types and that the shapes of both the stretch-spun viscose and the cupra rayons tend to approach the circular. Moreover, the serrated edge, once a fairly characteristic property of viscose, tends to be less and less conspicuous as the stretch process is carried further. It is desirable, therefore, that additional data be obtained to make the identification more certain, and the use of polarized light suggests itself." Reference should also be made to an article by Mr. Skinkle appearing in the Journal of the Textile Institute, April, 1932, P. T71. (S)

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THE ISOELECTRIC POINT OF WOOL.- Milton Harris.
Am. Dye. Rptr., June 20, 1932, P. 399.

An editorial abstract states "Suspensions of solvent--extracted Idaho and Australian raw wool and of scoured worsted cloth in buffer solutions of different pH--were prepared by grinding the dry wool to a fine powder and shaking the powder in the buffer solution. Electrophoretic measurements of these suspensions gave an isoelectric point for each wool at pH 3.4.

"The samples were slightly different in nitrogen content. If this is indicative of a difference in structure of the wool, the results indicate that the isoelectric point is very slightly or not at all affected by small differences in constitution.

"The theory and application of electrophoresis measurements to suspensions of wool are discussed."

Thirteen references are given to form a good bibliography on the subject. (S)

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COTTON HAIR: DEVELOPMENT.- A. P. Sakostschikoff and G. A. Korshenievsky.
Faserforschung, 1932, 9, 249-284.

The authors have studied the structure of the cotton hair at various stages of development by methods involving microscopic observation, micro-chemical reactions and swelling tests. The results of this work show that the development of the hair in the course of the first 15-16 days after flowering is characterised by the development of the hair cuticle and that cellulose deposition does not occur in this period. Cellulose first appears on the 16th day after flowering when the second period of development, i.e., the formation of the cell wall, begins. The cellulose is deposited in the form of a network in the space between the cuticle and the continuous concentric layers (growth rings) which are formed later. These concentric layers have a well-marked spiral structure. The network appears to be directly connected with the structure elements of the cell wall found in microscopic observations and in the reaction with concentrated sulphuric acid. A regular increase in the number of growth rings with age of the hair is not observed. A decrease in the protein content occurs with increasing age of the hair. Tanning materials are not found at any stage, and no evidence for the presence of starch has been obtained. The cuticle differs in structure from the cellulose of the hair. After long hydrolysis with zinc chloride the cuticle gives products which, like the products of hydrolysis of cellulose, give a blue colour with iodine. No fibrillar or spiral structure is observed in the cuticle under the microscope. The results of applications of the Calvert-Harland method to determinations of the "true" diameter of the hair show that this diameter remains constant during the development of the hair. Further work is necessary before a complete theory of the structure of the cotton hair can be formulated. (Copied complete from J. T. I., abstract section, June, 1932) (C)

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RAYON STAPLE FIBRE: SPINNING.- H. Stein.
Textilber., 1932, 13, 244-245.

The spinning of staple fibre on ordinary cotton machinery is discussed. It is proposed to condition the material to a moisture content of 17-19 per cent, then to open it in a bale breaker or hopper feeder and pass it through a double Buckley opener in combination with a lap machine without beater. Good results are also obtained with a single Buckley opener or a Creighton opener in conjunction with a lap machine. The card should have as fine a clothing as possible; with ordinary clothing it is advisable to run the licker-in somewhat slower and the flats somewhat quicker than for cotton. The best results are obtained using Platt's all-steel clothing. The following card settings are suggested: Feed

table/licker-in, 12 thousandths of an inch; licker-in/cylinder, 11 thousandths of an inch; cylinder/doffer, 8 thousandths of an inch; flats/cylinder, 11-8 thousandths of an inch. The number of revolutions of the cylinder is given as 160-165 per minute and of the doffer as 6 per minute. In order to prevent the web hanging down between the doffer and the calender rollers, due to the greater specific weight of staple fibre as compared with cotton, the rollers are run one to two teeth quicker. On the draw frame the delivery speed of the front rollers should not be greater than 30 m. per minute. The rollers should be set as far apart as possible, e.g., 49: 53: 59 mm., and the draft should be kept as low as possible. The slubber is run at a speed of 420-450 spindle revs. per minute, the roller settings are wide, for example 47 and 56 mm., and a twist coefficient of o.82 to o.85 should be sufficient. The intermediate frame should be run at 600 spindle revs. per minute, the roller settings 47 and 54 mm., and the twist coefficient o.89 to o.9, whilst for the roving frame the figures given are 720 to 750 revs. per minute, 45 and 51 mm., and 1.11 twist coefficient. Procedure on the ring frame is as for cotton but it is recommended that the spindle revolutions be somewhat reduced. The following temperatures and humidities are recommended for the various processes: Blow room and carding 20° C. and 63 per cent., drawing and speed frames 21° and 65 per cent., spinning 22° C. and 70 per cent. The following spinning plan is also given: Lap weight 32 lb., card sliver, o.2, draw frame sliver o.2, slubbing o.8, intermediate 2.o, roving 5.o, final counts 40.o. (Copied complete from J. T. I. abstract section, July, 1932.) (C)

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CELLULOSE: CONSTITUTION.- H. Pringsheim and K. Ward, jun.
Cell'chem., 1932, 13, 65-71.

Further investigations of the decomposition of cellulose acetate by boiling in chloroform solution in the presence of benzenesulphonic acid are described. By boiling for 48 hours in the presence of 1 per cent. of the acid, the preparation "B" was obtained in a yield 90-95 per cent. of the theoretical and free from reducing impurities. A substance, "preparation C," was obtained by fractionation with alcohol and had a rotary power of 66-69°. By hydrolysis with hydrochloric acid it is quantitatively converted into glucose. The results of treatment with malt extract and of cryoscopic investigations indicate that preparation C is not a uniform substance. If a solution of preparation C is purified by dialysis, the product obtained by precipitation with alcohol, "preparation D," has a rotatory power of 88 to 92°. The properties of this substance are described. Examination of the methylation products of preparation D indicates that it has comparatively large molecules containing more than four glucose residues. The Röntgen diagram of preparation C differs markedly from that of cellulose. (Copied complete from J. T. I. abstract section, July, 1932.) (C)

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ENZYMES, THEIR NATURE AND THEIR APPLICATION TO TEXTILES.- D. H. Powers.
Am. Dye. Rptr., May 23, 1932, P. 332.

A paper presented at the quarterly meeting of the Piedmont Section, American Association of Textile Chemists and Colorists, April 23, 1932, covering the nature of enzymes, effects of time, concentration, temperature, hydrogen ion, and the application of enzymes to textile work, including desizing, refinishing, and concluding with a paragraph on the evaluation of enzymes.(S)

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WYZENBEEK PRECISION WEAR TEST METER.- Dr. Ellery H. Harvey.
Am. Dye. Rptr., Mar. 14, 1932, P. 177.

An editorial abstract states "The increasing use of time and performance guarantees in modern merchandising places upon the research and control laboratory an added responsibility that can only be met by more adequate standardized methods of analysis and a greater understanding of what is involved by correct interpretation. In the field of textiles the importance of wear resistance has caused many testing devices to be built with more or less success."(S)

MICROSCOPICAL AND TECHNOLOGICAL EXAMINATION OF THE HAIR OF THE ANGORA RABBIT, THE HARE, AND THE COMMON RABBIT.- J. Plail.
Textilber., 1932, 13, 1-3, 61-63, 123-125. (Also Textilber., 1932,13 #2E, 33-5)

The production and uses of the above fibres are briefly discussed. The covering of the rabbit or hare is shown to consist of (1) the downy hair, fine and uniform and mostly medullated; (2) the guard or cover hair, longer and stiffer than the downy hair, and invariably medullated. The down of the three varieties presents the same appearance microscopically.

Fibre Length Determination. The results of measurements of fibre length are summarised thus--Angora rabbit wool Quality I should be pure white and show a mean length of above 40 mm. and the longest fibres should be above 10 cm. Combed wool should contain relatively few short fibres and clipped wool a greater proportion of short fibres. Angora rabbit wool Quality II should show a mean length up to 40 mm. and the longest fibres should not attain 10 cm. in length. The hair of hares and common rabbits used exclusively in hat manufacture should, after cropping, show a great uniformity of fibre length.

Strength and Elasticity. For fibre strength tests, the apparatus made by Louis Schopper, Leipzig, was used, and for the elasticity diagram the "Deforden" due to Krais. Lengths of 1 cm. were tested at 65% relative humidity and 20° C. A table is given showing the relative strengths of Angora, common rabbit and hare fibres of equal thicknesses. The Angora rabbit wool is relatively stronger than the hairs of the common rabbit and hare, although on the other hand the variation in the strengths of individual fibres is greater. The "cover" hairs of the common rabbit and hare which exhibit great differences of thickness show also great variation in strength. The elasticity curves gave the typical stress-strain diagrams consisting of three stages--(1) a period of slow stretching, (2) a period of rapid stretching, (3) a period of uniform slow stretching right up to the breaking point.

Influence of Dyeing. A commercial sample of Quality I Angora rabbit wool was treated with a series of dyestuffs of which details are given. A second series of dyeings was also performed on samples which had been steeped for one hour in 1% soda solution at 50° C. Strength tests were then performed on dried fibres of equal thickness (12μ) from each of the dyed samples. These showed--(1) that Angora rabbit wool without previous treatment shows with vat dyes the greatest decrease and with chrome dyes the least decrease in strength; (2) if previously treated with soda solution the acid dyeing gave best results from the point of view of strength, chrome dyeing the worst, and vat dyeing results in between the two. A list of comparative damage in dyeing to wool (due to Krais) and to Angora rabbit wool shows that chrome dyeing results in most damage.

Influence of Washing. From experiments made it is concluded that treatment with soap solutions results in no yellow colouration with Angora rabbit wool and a very faint yellow colouration with wool. Treatment with soda solution shows in the case of Angora rabbit wool a gradually increasing yellow colouration with increase in concentration of the solution. Staining with cotton red gives an intense colouration, showing progressive damage of the fibre.

Details are also given of the action of chlorine and of light on Angora rabbit hair. (Copied complete from J. T. I., abstract section, Aug., 1932.)(C)

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SILK AND RAYON GOODS: WEIGHTING AND WATERPROOFING.
Russa, 1932, 7, 35-39, 283-289.

A modification of the tin phosphate method of weighting is described in which magnesium chloride or another neutral salt is added to the bath. The weighting may be carried out in several stages or as a continuous process. Details of the procedures are given and suitable apparatus for the continuous process is described. The presence of a neutral salt increases the adsorption of the tin compound, permits the weighting process to be carried out in a much shorter time than formerly, and lowers the hydrogen-ion concentration of the bath, thus protecting the material from deterioration in the acid liquor. It is claimed that uniform results are obtained by this method and that the weighted material does not deteriorate on storing or on exposure to light. The addition of neutral salts is also recommended for increasing the adsorption of aluminium salts in the waterproofing of rayons. (Copied complete from J. T. I. abstract section, June, 1932.) (C)

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STARCH: MECHANICAL DEGRADATION.- G. Neumann.
Textilber., 1932, 13, 251-252.

Observation that the viscosity of a potato starch size in the sow box was very much less than its viscosity in the size kettle led to laboratory experiments in which a potato starch suspension was circulated by means of a pump, at temperatures of 55-65° C. Each complete circulation took 3 minutes and samples were transferred at intervals to test tubes, where 2 c.c. of a dye solution were introduced and the depth of penetration of the dye was observed. The experiments proved that mechanical movement produces considerable liquefaction of starch. The adhesive power of circulated starch solution as compared with that of the initial solution was then determined by means of strength tests on strips of filter paper impregnated with the solutions. The solution which had been circulated had a higher adhesive power than the initial solution, indicating that starch is actually hydrolyzed by mechanical movement. (Copied complete from J. T. I. abstract section, July, 1932.) (C)

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CARD FLATS: ACCUMULATION OF WASTE ON.- C. Gegauff.
Revue Text., 1932, 30, 239-245, 357-361.

An experimental study of the rate of accumulation of waste on card flats shows that the weight of waste on a given flat is proportional to the fourth root of the time during which it has been working. The percentage of waste on flats for a given card with the same cotton and same production is proportional to $I/t^{\frac{3}{4}}$ or to $v^{\frac{3}{4}}$ (t = time; v = velocity of flats). The velocity of accumulation on a flat is proportional to $I/t^{\frac{1}{4}}$.

Examinations of the flats as they move out of action have shown that neps and impurities are only found at the outer surface of the layer of waste carried away in the clothing; the remainder of this layer consists of normal cotton. An explanation of this fact is offered. The influence of the inclination, sharpness and length of the wires, and of the direction of movement of the flats on the amount of waste is discussed. It is concluded that flats moving in the direction opposite to the direction of motion of the cylinder surface are preferable to those moving in the same direction as the cylinder. (Copied complete from J. T. I., abstract section, June, July, 1932.) (C)

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LOOMS: ILLUMINATION.- O. Bitzenhofer.
Kunstseide, 1932, 14, 197-204.

The author describes in detail the results of a test of the influence of the intensity and distribution of the illumination on the efficiency of the weaving process. A set of eight looms weaving all rayon and rayon-wool fabrics

was used for the tests. Observations were made by daylight, an old system of illumination with one lamp per loom, and a new system with two lamps per loom. The lamps used in the old system spread the light over a wide area whilst the new lamps are designed to concentrate the light on the loom. Diagrams showing the shape and position of the lamps are given. The observations are recorded in the form of tables showing efficiencies, time required for 10,000 picks, warp and weft breaks, lost time, etc. With the new system three different intensities of illumination were tested. With the lowest of these, which provided 200-300 lux at the working surface, the results were comparable with those obtained with daylight illumination and showed a 12-18 per cent. increase in production over that with the old system of illumination. The corresponding increase in current consumption was comparatively small. With greater intensities of illumination the efficiency decreased, probably owing to the dazzle produced by reflections on the surface of the rayon. (Copied complete from J. T. I., abstract section, Aug., 1932.) (C)

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USES OF PHOSPHATES IN TEXTILES.- N. D. White.
Dyer and Calico Printer, 1932, 67, 470-471.

Disodium phosphate is used as an addition to the dye-bath when mixtures of different fibres are involved. The phosphate makes the baths slightly alkaline, which retards the action on animal fibres by direct dyes. It is well to find out the best amount to add to give good results and keep to this, as too much decrease in the affinity of the fibres would mean more dyestuffs than otherwise necessary being used. In hosiery dyeing it is of great value in preventing uneven dyeing with mixed fibres. Disodium phosphate is largely used in weighting silk goods by the tin-phosphate-silicate process.

Trisodium phosphate, which is a slightly stronger form, is used in the kier boiling of cotton goods. It assists the caustic soda in emulsifying the natural waxes, increasing the detergent action of the boiling-off liquor, and dissolving impurities, and it also preserves the strength, as it acts as a buffer against the powerful action of the caustic soda. Therefore it gives better results--a shorter time.

In textile processing when the pH of a bath is found to be wanting in alkalinity tri-sodium phosphate is a very good thing to raise it, as a small addition will not materially change the property of the baths. (Copied complete from J. T. I., abstract section, Aug., 1932.) (C)

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CONSTITUTION OF THE KERATIN MOLECULE.- C. Rimington.
Nature, 1932, 129, 580-581.

Reference is made to a communication to Nature of Speakman and Hirst, on comparisons of the work necessary to stretch wool fibres in water, in acids, and after treatment with nitrous acid. The present writer criticises the assumption of Speakman and Hirst that every molecule of glutamic or aspartic acid has one carboxyl group free to enter into salt formation with an amino group. Wool yields upon hydrolysis, 1.2% of "ammonia"--or "amide"--nitrogen. The general opinion among protein chemists is that this ammonia exists in the protein in the form of acid-amide linkages, with one or other of the dibasic amino acids. It is suggested that Speakman and Hirst must therefore deduct 12.6% by weight of glutamic acid from the 12.9% contained in wool, since this is presumably in combination with the 1.2% of ammonia nitrogen, leaving 0.3% of glutamic acid and 2.3% of aspartic acid (say 2.6% in all) free to enter into the type of union they postulate with the basic amino acids. The question is also raised by the present writer as to whether hydroxylysine may not be a constitutent of wool. (Copied complete from J. T. I., abstract section, Aug., 1932.) (C)

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FACTORS EFFECTING QUANTITATIVE DETERMINATION OF LIGNIN BY 72% SULFURIC ACID METHOD.- G. J. Ritter, R. M. Seborg and R. Mitchell.
J. Ind. & Eng. Chem., Anal. Ed., Apr. 15, 1932, P. 202.

A discussion is given of the discovery of additional factors that effect the quantitative determination of lignin in wood. Owing to a knowledge of these factors, the following modification has been incorporated in the forest products laboratory methods for the determination of lignin in wood; the residue after extraction with alcohol benzene should be extracted with hot water. The concentrated acid-wood mixture should be kept in a bath at 20° C. Two hours should be allowed for the solution of the carbohydrate in the 72% sulfuric acid. Dilute mixtures should be hydrolized for four hours. (S)

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THE EFFECT OF TEMPERATURE ON SULFURIC ACID METHOD FOR LIGNIN.- C. J. Peterson, A. W. Walde, R. M. Hixon.
J. Ind. & Eng. Chem., Anal. Ed., Apr. 15, 1932, P. 216.

It was pointed out in a preceding paper by these authors, to be found in J. Ind. & Eng. Chem., Anal.Ed., Vol. I, 1929, P. 65, that the sulfuric acid method for the determination of lignin gave results considerably higher for flax and hemp and cornstarch than did the Willstätter method. Since the variation was observed in the results of independent workers, in spite of every effort in uniformity in the method, it was concluded to be caused by seasonal variation in temperature. Direct experiment not only proved that the values obtained for lignin by the 72% sulfuric acid method depends upon the temperature at which the analysis was made, but also revealed the fact that the difficulty of filtration frequently encountered in this analysis was also due to the higher temperatures. A chart showing the effect of temperature on the percent of lignin as determined by sulphuric acid method is given. The percentages are substantially higher, ranging from 3 to 5% for increases of from 15° to 30° C. This evidently is a range in which most of the work would be done. Three references are given to the literature. (S)

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THE TEXTILE TESTING LABORATORY.- Elizabeth S. Weirick, Sears Roebuck & Company.
Am. Dye. Rptr., Feb. 29, 1932, P. 154-159.

A brief article noting information on laboratory organization, laboratory service, the testing of textiles noting the various types of tests which are made, some detail as to sizing, thread count, tearing and strength tests, color fastness, fastness to light, shrinkage, wearing quality, absorbent quality, water-resistance, purchasing standards, and a summary giving the values of the testing laboratory as follows: "It stimulates the production of better products; eliminates worthless products. Protects merchant and consumer from disrepresented merchandise. Cuts down returns by accurate descriptions of goods and through the advice to customers on the correct care of goods. Helps buyers to a more intelligent knowledge of their goods. Helps to maintain uniform qualities of merchandise and therefore creates confidence in the minds of the consumers and thus leads to a more stable and better business. (S)

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BIBLIOGRAPHY

THE EMULSIVE CAPACITY OF SULPHONATED OILS.- Ralph Hart.
J. Ind. & Eng. Chem., Anal. Ed., Jan. 15, 1932, P. 119.

The emulsive capacity of a sulphonated oil is determined by mixing it with various amounts of olive oil, clearing with oleic acid, and finally testing the stability of the emulsion. The emulsive capacity is useful in formulating commercial products, and serves also as a criteria of quality and as a means of identification. (S)

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RETTING OF WOOL.- R. Waters.
Nature, Vol. 129, 1932, P. 467.

Wool fibre may be broken down into its constituent cells by retting in a culture of what appears to be a variety of bacillus bulgatus. The resultant material is convenient for the study of the cells which are apparently not attacked by the organism. (S)

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MICRO-ANALYTICAL METHOD AS TIME AND LABOR SAVER.- E. M. Chamot.
J. Ind. & Eng. Chem., Anal. Ed., Jan. 15, 1932, P. 7-8.

The micro-chemical and microscopical methods of analysis which are being developed possess potential economic possibilities with which all analysts should become familiar. They provide the most practical way of reducing cost and of saving time in analytical and research laboratories as well as providing solution of many problems insoluble by other means. (S)

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A METHOD FOR SIMULTANEOUSLY MAKING A LARGE NUMBER OF PERSPIRATION TESTS.- John N. Dalton.
Am.Dye. Rptr., July 18, 1932, P. 450.

A paper presented before the Northern New England Section May 7, 1932, at Cambridge, Mass. A brief paper with several pages of discussion all worthy of further notice. (S)

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SOME OBSERVATIONS ON LIGHT FASTNESS.- Joseph W. Russell.
Am. Dye. Rptr., July 4, 1932, P. 423.

This was a paper presented at the May meeting of the Northern New England Section of the American Association of Textile Chemists and Colorists, May 7, 1932. (S)

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THE RESEARCH CHEMIST LOOKS AT CONSUMER TEXTILES.- Ephraim Freedman.
Am. Dye. Rptr., June 20, 1932, P. 388.

A brief paper outlining certain experiences of the author with consumer's specifications and the methods of handling tests. Discussion of the paper was carried on at considerable length and is reported more or less in detail. (S)

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SOME FLEETING GLIMPSES OF CERTAIN PROPERTIES OF SERICIN.- H.H. Mosher. (U. S. Testing Company)
Am. Dye. Rptr., May 23, 1932, P. 341.

A paper presented at the April meeting, New York Section of the American Association of Textile Chemists and Colorists, giving some of the products of hydrolysis of sericin and fibroin, and the results of certain other analytical tests. (S)

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OIL STAINS.- H. R. Hirst.
Am. Dye. Rptr., April 25, 1932, P. 273.

An editorial abstract states "The effects of exposure to light, of scouring and dyeing, and of steaming and storing, on wool stained with various types of oil are discussed in this article." (S)

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THE COLORSCOPE. RECENT DEVELOPMENTS.- H. H. Sheldon and Milton Gluck.
Am. Dye. Rptr., Mar. 28, 1932, P. 222.

Noting the methods of overcoming several difficulties which came up in the utilization of the Sheldon Colorscope and describing a demonstration of the instrument. (S)

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DETERMINATION OF SMALL AMOUNTS OF ACIDS, ALKALIES, AND SALTS IN TEXTILES.- A. A. New.
Am. Dye. Rptr., Mar. 14, 1932, P. 180.

A brief article giving a review of the literature on this subject. Several British and numerous American references are noted. (S)

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VOLUMETRIC REDUCTION OF DYES WITH HYDROSULFITE.- W. C. Holmes, C. G. Melin and A. R. Peterson.
Am. Dye. Rptr., Mar. 28, 1932, P. 213.

An editorial abstract states "This paper constitutes the 206th contribution from the Color and Farm Waste Division, Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C." (S)

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NEW IDEAS IN WOOL SCOURING, MILLING, SHRINKING AND FINISHING.- J.B.Speakman.
Am. Dye. Rptr., Mar. 28, 1932, P. 214.

An editorial abstract states "In this paper three processes--scouring, milling and shrinkage--are discussed in relation to the scale structure of the fibre. This structure presents a difficulty in the utilization of wool and is of the greater importance. For some years a detailed study has been made of the milling process and the related scouring and chlorination of unshrinkable processes. New ideas in relation to these processes are herein presented." (S)

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UNSHRINKABLE WOOL FABRICS: PRODUCTION OF. I, II.
Wool Rec., 1932, 41, 801, 855.

A review of methods of chlorinating and chroming wool to make it unshrinkable. Tendering may be considerably reduced when the chlorination by means of bleaching powder solution and boric acid is carried out in the presence of phenolic substances. (Copied complete from J. T. I., abstract section, June, 1932.) (C)

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THE STRUCTURE OF FIBRES.- W. T. Astbury.
Annual Report of the Chemical Society, 1931, 28, 322-35.

The subject is discussed under the following headings--general characteristics; reversible transformations in fibre structure; the general theory of fibre structure; cellulose and its derivatives; natural silk; animal hairs,etc.; micelle size; the molecular weights of proteins; the denaturation of proteins; the pH stability region of insoluble proteins; mineral fibres; X-ray investigation of the structure of a single ramie fibre. (Copied complete from J. T. I., abstract section, June, 1932.) (C)

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KINEMATICS OF TWIST. II. SOME SIMPLE APPLICATIONS.- H. J. Woods.
J. Text. Sci., 1932, 4, 66-67.

In this article, the author applies the results obtained in Part I (J. Text. Sci., 1931, 4, 33-36), to certain well-known twisting processes such as ring, flyer, and mule spinning and mentions the theoretical possibility of a machine being devised wherein the yarn is twisted without rotation of its ends. Such a machine would allow winding and twisting to take place independently. (Copied complete from J. T. I. abstract section, July, 1932.) (C)

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COTTON AND RAYON: MORDANTING BATHS.- J. P. Sisley.
Chim. et Ind., 1932, 27, 521-524.

The author reviews the methods which have been suggested for imparting affinity for acid dyes to vegetable fibres and describes a method of mordanting which makes possible the dyeing of cotton and of viscose and cuprammonium rayons with acid and chromable acid dyes. A mordanting bath containing the product of the condensation of a primary or secondary amine with an aliphatic aldehyde in the presence of a mineral acid is used. The condensation product of o-toluidine with formaldehyde is frequently used. The dyeings obtained with acid dyes are fast to water and acids but in certain cases the fastness to light is not good. (Copied complete from J. T. I. abstract section, June,1932) (C)

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IMITATION IRON YARN: PREPARATION.
Textilber., 1932, 13, 223.

The latest method for imparting to cotton yarn an appearance similar to that of an iron yarn, and a high stiffness, is to impregnate the cotton yarn with a solution of viscose, so that the yarn is surrounded with a cellulose sheath. A typical starch finish for smooth lustrous yarns of this type is prepared by making, for 100 litres of mixture, a paste of 10 kg. of potato flour with luke-warm water and adding 2 kg. of steeped gelatin, 1 kg. of glycerin, 200 g. of paraffin, 300 g. of Japan wax and 60 g. of diastafor. The mass is heated to 65° C. and maintained at that temperature for 8 minutes, after which it is boiled up and the yarn sized at 60-70° C. The yarn is subsequently lustred on a polishing machine. A finishing mixture prepared by hydrolysing starch with Degomma D L and adding a softener (Triumphavivage is mentioned) and a fat, preferably an emulsifiable fat, is also recommended. (Copied complete from J. T. I. abstract section, June, 1932.) (C)

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LOOMS: TACHOGRAPHIC INVESTIGATION.- E. Ullrich.
Textilber., 1932, 13, 130-131, 186-188.

The use of the tachograph in the investigation of loom running regularity is discussed and illustrated by 24 tachograms obtained with a Jacquet hand tachograph. Regular, even if considerable, acceleration of the crankshaft gives a uniform cloth, but irregular variations cause weft stripiness. Looms which run regularly have a longer life and lower power consumption than looms running irregularly. The author contends that all looms, especially new and reconditioned looms, should be studied in this way; if the purchaser would demand a tachogram and guarantee of power consumption with new looms, loom manufacturers would make greater efforts to attain maximum regularity with minimum power consumption. (Copied complete from J. T. I. abstract section, June,1932) (C)

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BACTERIAL DISINTEGRATION OF THE WOOL FIBRE.- R. Burgess.
Nature, 1932, 129, 691.

With reference to a note by Waters on the retting of wool (Nature, Mar. 26, 1932, P. 467) details are given showing that workers on wool research have long been acquainted with the bacterial disintegration of the wool fibre. The retting process has been associated chiefly, but not exclusively, with members of the aerobic group of the Bacillaceae (Bergey). As suggested by Waters, the process, or perhaps the enzyme-containing extract, may be used to facilitate the study of the cellular structure of wool. (Copied complete from J. T. I., abstract section, July, 1932.) (C)

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RAYON FILAMENTS: CREASING PROPERTIES.
Text. Merc., 1932, 86, 539.

A short general article on the creasing properties of fibres and recent methods for reducing the creasibility of cotton and rayon fabrics. The suggestion is put forward that for a rayon fibre to resist creasing the central core of micellae should be in parallel orientation and the outer layer randomly distributed. (Copied complete from J. T. I., abstract section, Aug.,1932). (C)

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FURTHER RESEARCHES ON STRENGTH AND EXTENSION OF WOOL FIBRES BY MEANS OF THE TÄNZER-POLIKEIT DYNAMOMETER.- H. Kärrner.
Z. f. Züchtung, B, 1932, 23, 377-419.

A complete account of studies of extension on 1,858 wool fibres. A variation of 2-69 per cent. was found, the mean being about 37.74 per cent. For relative strength the mean was 17.319 kg., the variation being 3,628-28,890. Positive correlations were found between thickness and strength, cross-section and strength, strength and extension; no correlation was found between relative strength and thickness and relative extension and thickness. There was no difference in the normal curve between fine and coarse hairs, all wool hairs apparently behaving in the same manner. (Copied complete from J. T. I. abstract section, Aug., 1932.) (C)

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PRODUCTION OF COLLOIDAL DISPERSIONS OF NATURAL SILK.- Kanegafuchi Boseki Kabushiki Kwaisha, Japan. G. P. 542,052.

The silk is peptised with a solution of magnesium nitrate, which, unlike the magnesium salts used hitherto, may be completely removed by dialysis, the fibres produced from the resulting sol being extremely strong and resistant. (Copied complete from J. T. I., abstract section, June, 1932.) (C)

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DEGUMMING ACTION OF SOAP ON RAW SILK.- A. R. Tsunokaye.
J. Soc. Dyers and Col., 1932, 48, 164-167.

The degumming power of a boiling soap solution is the more marked, the greater is the degree of hydrolysis. Apparently the alkali of the soap solution combines with sericin and fibroin. (Copied complete from J. T. I. abstract section, July, 1932.) (C)

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RUBBERISED FABRICS: CAUSES OF SPOTS ON.- G. Martin and J. Sisley.
Chem. Abs., 1932, 26, 2345-6 (from Rev. gen. caoutchouc, 1931, 8, 77, 3-4).

Rose-coloured spots on a white ribberised fabric (2 plies with a rubber binder) were proved by extraction with water and with acetic acid and by characteristic chemical reactions to be the result of oxidation of an aromatic base in acid medium in the presence of air. Furthermore, fabrics containing aniline, and particularly aniline hydrochloride, became rose- or beige-coloured in an acidic atmosphere. When rubberised fabrics containing traces of aniline or a salt of aniline were allowed to stand, only those with the aniline salt turned rose. In the original case, the accelerator or a softener probably accounted for the presence of an amine, while the acid probably originated in the fabric, perhaps by the catalytic effect on the rubber of traces of copper which were found in the fabric. (Copied complete from J. T. I., abstract section, Aug., 1932.) (C)

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Note.- For abbreviations of titles of publications abstracted herein refer to the March and April, 1932, issues.